SPECIFICATION

MULTI MACHINE INSPECTION SYSTEM

5   The present invention relates to machines,
which inspect bottles for defects and more
particularly to a system, which includes a number of
such machines collectively evaluating a bottle.

10   ## BACKGROUND OF THE INVENTION

       Machines for inspecting glass bottles conduct a
great variety of inspections including an inspection
for the mold cavity data so that an operator will
15   know where a defective bottle was made and can
promptly adjust the bottle making process to elimin-
ate the problem at that mold. Conventionally a
single machine can only handle a limited number of
inspections and as a result a number of machines
20   will sequentially receive the bottle to be inspected
and together all the required inspections will be
completed.
       Each machine has its own inspection system,
which will determine whether any processed bottle
25   has passed or failed each of the inspections
conducted by the machine. Conventionally, a
machine's data is transmitted to a supervisory
computer, which receives similar data from the other
machines and combines the data for subsequent use.
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                       ## OBJECT OF THE INVENTION

       It is an object of the present invention to
provide a system for inspecting glass containers,
35   which is defined by a number of machines which
eliminates the requirement of a supervisory
computer.

Other objects and advantages of the present invention will become apparent from the following portion of this specification and from the accompanying drawings which illustrate, in accordance with the mandate of the patent statutes, a presently preferred embodiment incorporating the principles of the invention.

BRIEF DESCRIPTION OF THE DRAWINGS

Figure 1 is an elevational schematic view of a system for inspecting bottles; and

Figure 2 is a logic diagram for the processor of each of the machines shown in Figure 1.

BRIEF DESCRIPTION OF THE PREFERRED EMBODIMENT

Figure 1 shows a number of inspection machines M1,M2,Mn which sequentially inspect a bottle 10. The bottle is conveyed through the machines via any number of conveyors 12 which could include belt conveyors which support the bottom of a bottle or devices which have opposed pairs of belts which grip the side wall of a bottle, for example. An encoder 14 is associated with each conveyor so that the position of a bottle can be tracked through the machine. Also present at the entry of each machine is a part present sensor 16 and a rejector 18 is located following the discharge of a bottle from the last machine.

Each machine has an inspection system 19, which includes a number of inspection stations 20 (more than one inspection could be performed at a single station). The processor 22 in each inspection system will identify the bottle being inspected as the part passes the bottle present sensor and will

inspect the bottle. At the completion of the inspection processes carried out by a machine, the processor will know whether or not any of the inspections carried out by that machine indicate
5   that the bottle should be rejected. As can be seen from figure 1, neighboring processors are connected via an Ethernet cable 24. Referring to Figure 2, the query "Is there an Upstream Machine" 30 will be answered in the negative for the processor in the
10   most upstream location. Accordingly, this processor will form its data into an Ethernet Packet and Pass Ethernet Packet To Next Downstream Machine 32.

This query will be answered in the affirmative for any downstream processor and a downstream
15   processor will Combine Ethernet Packet From Next Upstream Machine With Inspection Data 34. Where the machine is a middle machine (one that has a machine on either side) the query "Is There A Downstream Machine?" 36 will be answered in the affirmative and
20   the processor of that machine will Transmit Ethernet Packet Of Combined Data To Next Downstream Machine 38. The combined data will be the data received via the Ethernet packet from the next upstream machine and the inspection data for the machine. The
25   processor of the most downstream machine accordingly functions as a supervisory computer having all the data of all the inspection machines.